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My research interests focus on biosynthesis of archaeal membrane lipids. The archaeal lipids glycerol dialkyl glycerol tetraethers (GDGTs) have been widely used as sea surface temperature proxy to study past climate change, but their biosynthetic pathway is still unknown. As a result, our understanding of GDGT physiology is limited and this may impact their use as robust paleo-temperature proxies.

I visited Dr. Roger Summons' lab at MIT in early October to learn and perform GDGT analysis with HPLC-MS. Dr. Xiaolei Liu, a postdoctoral fellow in the Summons lab, helped me analyze the GDGT profile of *Sulfolobus acidocaldarius* samples I previously cultured at Stanford. A total of 54 cultures were incubated under different temperatures, pHs, and growth phases to investigate how these various conditions affect GDGT structure in *S. acidocaldarius*. Dr. Liu has rich experience in interpreting GDGT profiles to identify derivative and novel GDGTs. Under his mentorship, I learned how to interpret chromatography data, which is the most important aspect of GDGT characterization. After my two week visit, our data indicated that *S. acidocaldarius* increases the GDGT ring index as temperature increases and pH decreases. Currently, I am associating these GDGT profiles with transcriptomic data to identify potential GDGT biosynthesis genes. Subsequently, I will use genetic deletion analyses to determine if any of these candidate genes are involved in GDGT biosynthesis.

